

REMARKS

Claims 1, 2, 3, 5, 36, 40, 42-45, 47-52 and 56-58 have been rejected under 35 U.S.C. 102(b) as being anticipated by Noack (U.S. Patent 1,948,940).

Claim 1 recites "a water injection element configured to introduce water to the combustion chamber".

The Examiner indicates that element 18 of Noack is a water injection element that introduces water into the combustion chamber. (Final Office Action, Page 2.) The Examiner alternately indicates that element 18 identifies "the area where water is introduced to the combustion chamber". (Final Office Action, Page 5.)

However, as described in applicant's previous response and in more detail below, element 18 of Noack does not represent a water injection element or an area where water is introduced into the combustion chamber. Indeed, water is not included in the combustion process of Noack. Rather, the combustion process described by Noack includes igniting a fuel/air mixture in the absence of water.

Because there seems to be some confusion concerning the operation of Noack, the Applicant has attached Exhibits A-D, which use color-coded flows to illustrate the operation of Noack.

Exhibit A is an enlarged version of Fig. 1 of Noack, which has been modified to show the combustion process described by Noack. In general, the combustion process is illustrated in red in Exhibits A-D. Noack describes the combustion process as follows.

"Through the lower end of the conical bottom section combustion air is admitted to the chamber". (Noack, page 1, lines 62-63.) The introduction of air to the

combustion chamber is represented by line 101 in Applicant's Exhibit A.

"The fuel is injected into the combustion chamber through nozzles 21 ..., the fuel being supplied from a fuel line 23". (Noack, page 1, lines 78-81). The injection of fuel into the combustion chamber is represented by line 102 in Applicant's Exhibit A.

The fuel and air form a fuel-air mixture, which is generically represented as element 103 in Applicant's Exhibit A. "The fuel-air mixture is ignited by sparkplug 24 or other suitable means". (Noack, page 1, lines 81-83.) The spark that ignites the fuel-air mixture is represented by line 104 in Applicant's Exhibit A.

"The combustion gases are discharged from the chamber through the gas tubes 17". (Noack, page 1, lines 83-85.) The path of the combustion gases is represented by lines 105 and 106 in Applicant's Exhibit A. Note that Fig. 1 of Noack illustrates that one of the gas tubes 17 is continuous with the combustion chamber at area 18 near the top of the combustion chamber. Fig. 2 of Noack illustrates that there are 29 additional gas tubes 17 located outside the cross sectional view of Fig. 1. The combustion gases enter the gas tubes 17 in area 18 of combustion chamber (line 105). The combustion gases then travel downward through these gas tubes 17, and are discharged from the combustion chamber (line 106).

Exhibit B is an enlarged version of Fig. 2 of Noack, with the insides of the gas tubes 17 colored red to represent the combustion gases. Because Fig. 2 represents a top view of the combustion chamber, the combustion gases are traveling "down into the page" in Exhibit B.

Exhibit C is an enlarged version of Fig. 1 of Noack, which has been modified to show the water heating/steam generating process of Noack. In general, water flow is illustrated in blue, and steam flow is illustrated in green in Exhibits C-D. Noack describes the water heating/steam generation process as follows.

"A water inlet duct 13 [is] adapted to receive water from the [circulating] pump 7". (Noack, page 1, lines 60-61.) This water flow is represented by line 201 in Applicant's Exhibit C.

"A plurality of water tubes 16, [are] connected with the water inlet duct 13 of the bottom section 6". (Noack, page 1, lines 65-69.) This water flow is represented by lines 202 and 203 of Applicant's Exhibit C. Dashed line 202 represents water flow between continuous portions of water inlet duct 13. Line 203 represents the general location of water flow from the right-most portion of the water inlet duct 13 to one of the water tubes 16.

The gas tubes 17 are arranged concentrically within the water tubes 16. (Noack, page 1, lines 70-73.) As a result, a relatively thin cylinder of water moves through each water tube 16 from the circulation pump 7 toward the top section 9. (Noack, page 1, lines 84-87.) Exhibit D is an enlarged version of Fig. 2 of Noack, with the cylinders of water moving through the water tubes 16 colored light blue. Because Fig. 2 represents a top view of the combustion chamber, the cylinders of water are traveling "up out of the page" in Exhibit D (i.e., in the opposite direction of the 'red' combustion gases inside of the gas tubes 17). The combustion gases in the gas tubes 17 heat the thin cylinders of water moving through the water tubes 16. (Noack, page 1, lines 83-86.)

The heated water rising in the water tubes 16 discharges into a space 26 in the top section 9. (Noack, Page 1, lines 88-90.) This water flow is generally represented by line 204 in Exhibit C.

"A portion of the water flows downwardly through an annular inlet" to "a confined space 31". (Noack, page 1, lines 91-94.) This water flow is represented by lines 205 of Exhibit C.

As the water passes into space 31, the steam bubbles separate. The steam separated from the water rises to the top of the space 31 and discharges through pipe 33 into steam dome 32. (Noack, page 1, lines 96-102.) This steam flow is represented by line 206 of Exhibit C.

The water remaining in space 31 is carried downwardly through the return conduits 19 and into the outlet duct 12. (Noack, page 1, lines 102-104.) The water path from space 31 to one of the return conduits 19 is generally represented by line 207 of Exhibit C. Note that while Exhibit C illustrates one of the return conduits 19, Exhibit D illustrates that there are 5 additional return conduits 19 located outside the cross sectional view of Exhibit C. Each of these six return conduits carries water from space 31 to the water outlet duct 12. The water flow from return conduits 19 to the outlet duct 12 is represented by line 208 in Exhibit C. The water flow through return conduits 19 is illustrated with a dark blue color to distinguish this flow from the water flow through water tubes 16. The water outlet duct 12 leads the water back to the circulation pump 7. (Noack, page 1, lines 58-59.) The water flow from water outlet duct 12 to pump 7 is represented by line 209 of Exhibit C.

Portions of the water not flowing into the confined space 31 rise through the openings 36 into an apertured basin 37. (Noack, page 1, lines 104-107.) This water flow is represented by lines 210 of Exhibit C.

Heavier water particles collect in the space around basin 37 and are returned through a pipe 38 to the return conduits 19. (Noack, page 1, line 110 to page 2, line 3.) This water flow is represented by line 211 in Exhibit C.

Steam rising from the basin 37 also collects in the steam dome 32. (Noack, page 2, lines 3-4.) This steam flow is shown by line 212 in Exhibit C.

In view of the above detailed illustration of the described operation of Noack, it is apparent that water is not injected into area 18 within the combustion chamber. In fact, the fuel/air mixture ignited in the combustion chamber does not come into direct contact with the water/steam at any time. Thus, Noack fails to teach or suggest that water is or should be injected into the combustion chamber as recited by Claim 1.

For these reasons, Claim 1 is not anticipated by Noack. Claims 2-3, 5, 36, 40, 42-45 and 47, which depend from Claim 1, are not anticipated by Noack for at least the same reasons as Claim 1.

Claim 48, which recites "a water injector configured to ... introduce a water flow into the combustion chamber" is not anticipated by Noack for the same reasons as Claim 1. Claims 49-52 and 56-58, which depend from Claim 48, are not anticipated by Noack for at least the same reasons as Claim 48.

In addition, Claim 36 recites "wherein ignition inlet, fuel inlet and air inlet are all located adjacent to a first end of the combustion chamber, and the vapor outlet is located at a second end of the combustion chamber, opposite the first end".

Noack explicitly teaches that the air inlet is located near a first end of the combustion chamber, and the fuel inlet is located near a second end of the combustion chamber. For this additional reason, Claim 36 is not anticipated by Noack.

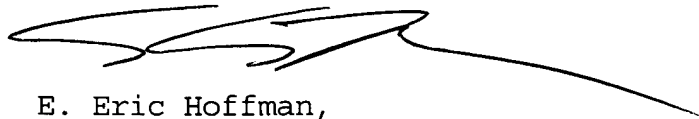
Claims 37-39, 41, 46 and 55 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Noack in view of Official Notice. However, the Official Notice does not overcome the above-described deficiencies of Noack. Claims 37-39, 41 and 46, which depend from Claim 1, are allowable over Noack in view of the Official Notice for at least the same reasons as Claim 1. Similarly, Claim 55, which depends from Claim 48, is allowable over Noack in view of the Official Notice for at least the same reasons as Claim 48.

The Examiner has objected to Claims 4, 6, 53 and 54 as being dependent upon a rejected base claim. The Examiner has indicated that these claims would be allowable if re-written in independent form including all of the limitations of the base claim and any intervening claims. However, because the Applicant believes that the independent Claims 1 and 48 are allowable for reasons stated above, the Applicant chooses not to amend Claims 4, 6, 53 and 54 at this time.

CONCLUSION

Claims 1-6 and 35-58 are pending in the present Application. Reconsideration and allowance of these claims is requested. In the event a Notice of Allowance is not issued, Applicant submits herewith a Notice Of Appeal. If the Examiner has any questions or comments, he is invited to contact the undersigned.

Respectfully submitted,



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